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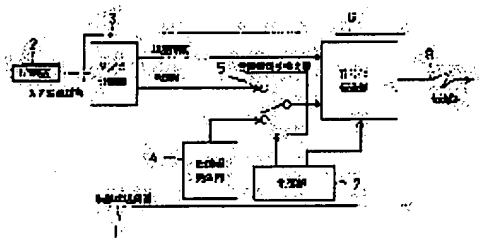
(54) METHOD AND DEVICE FOR VIDEO TRANSMISSION

(57)Abstract:
PURPOSE: To keep picture quality as high as possible with respect to luminance information at the time of reducing the generated code volume by efficiently encoding and transmitting a video signal in accordance with a need for color information in the video transmission device used for a video conference or the like.
CONSTITUTION: A video transmission device 1 consists of a color information generation part 4, a color information switching part 5, and an encoding and transmission part 6. The color information switching part 5 switches color information from an input video signal and that from the color information generation part 4, and selected color information is encoded and transmitted together with luminance information by the encoding and transmission part 6.



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CLAIMS

[Claim(s)]
[Claim 1] The image transmission equipment characterized by to have coding and the transmission part which carries out coding transmission of the color information generating section which generates color information, the color information switch section which choose any of color information and the color information on an input video signal which are outputted from said color information generating section they are, and the brightness information of an input video signal and the color information outputted from said color information switch section.

[Claim 2] Image transmission equipment according to claim 1 characterized by choosing the color information from the color information generating section as color information to encode when reducing the amount of generating signs of video-signal coding.
[Claim 3] The color information generating section which generates color information, and the color information switch section which chooses any of color information and the color information on an input video signal which are outputted from said color information generating section they are, Image transmission equipment characterized by having said color information generating section and the monochrome judging section which performs control of said color information switch section from coding and the transmission part which carries out coding transmission of the brightness information of an input video signal, and the color information outputted from said color information switch section, and the statistical property of an input video signal.
[Claim 4] The color information generating section which generates color information, and the color information switch section which chooses any of color information and the color information on an input video signal which are outputted from said color information generating section they are, Image transmission equipment characterized by having said color information generating section, the color information switch section, and the field control section that performs control of coding and a transmission part about coding and the transmission part which carries out coding transmission of the brightness information of an input video signal, and the color information outputted from said color information switch section, and the field of arbitration.
[Claim 5] Image transmission equipment according to claim 4 characterized by assigning the amount of generating signs few rather than the field which does not use the color information to the field using the color information on the color information generating section.
[Claim 6] It is the image transmission equipment according to claim 4 or 5 which adds the speaker distinction section and is characterized by encoding the color information from the color information generating section except a speaker's field.
[Claim 7] It is the image transmission approach which adds color information only about a speaker in the image transmission approach which notifies a speaker, and is characterized by the other field encoding as a monochromatic image.
[Claim 8] It is the image transmission approach which adds color information only about a speaker, uses the other field as a monochromatic image in the image transmission approach which notifies a speaker, and is characterized by performing many allocation-code-izing and

transmissions for the amount of generating signs to a speaker field.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the image transmission equipment and the approach which are used for a video conference system etc.
[0002]
[Description of the Prior Art] About the conventional image transmission equipment used for a video conference system, there is image transmission equipment based on ITU-T recommendation H.261, for example. This performs coding and transmission as the information source which consists an input video signal of brightness information and color information.
[0003]
[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional image transmission equipment, when color information is not important, the ratio of the sample of color information and brightness information is transmitted, while it has been fixed.
[0004] For this reason, since color information and brightness information are encoded by the same technique even when changing the image quality of a video signal to change of the capacity of a transmission line, when brightness information changes by the same ratio as color information and decreases color information, brightness information will also decrease. Moreover, even if it is the video signal which photoed the monochromatic photographic subject, by an environmental change and an environmental noise, the fluctuation on the time amount of the color information of a flicker of color information and space will occur, and coding effectiveness will fall.
[0005] It is originated in view of such a situation, and this invention aims at enabling it to gather coding effectiveness according to the need for color information, or the situation of an input video signal. Moreover, in case the amount of generating signs is reduced, it aims at maintaining image quality as much as possible about brightness information. Furthermore, while attaining high promotion of efficiency of coding and transmission, it aims at notifying **** of cautions to a specific region to a receiving side.
[0006]
[Means for Solving the Problem] The image transmission equipment of claim 1 concerning this invention is characterized by to have coding and the transmission part which carries out coding transmission of the color information generating section which generates color information, the color information switch section which choose whether any of color information and the color information on an input video signal which are outputted from said color information generating section they are, and the brightness information of an input video signal and the color information outputted from said color information switch section.
[0007] In the image transmission equipment of above-mentioned claim 1, image transmission equipment of claim 2 concerning this invention is characterized by choosing the color information from the color information generating section as color information to encode, when reducing the amount of generating signs of video-signal coding.
[0008] The color information generating section which the image transmission equipment of claim 3 concerning this invention makes generate color information, The color information switch

section which chooses any of color information and the color information on an input video signal which are outputted from said color information generating section they are, It is characterized by having said color information generating section and the monochrome judging section which performs control of said color information switch section from coding and the transmission part which carries out coding transmission of the brightness information of an input video signal, and the color information outputted from said color information switch section, and the statistical property of an input video signal.

[0009] The color information generating section which the image transmission equipment of claim 4 concerning this invention makes generate color information, The color information switch section which chooses any of color information and the color information on an input video signal which are outputted from said color information generating section they are, It is characterized by having said color information generating section, the color information switch section, and the field control section that performs control of coding and a transmission part about coding and the transmission part which carries out coding transmission of the brightness information of an input video signal, and the color information outputted from said color information switch section, and the field of arbitration.

[0010] Image transmission equipment of claim 5 concerning this invention is characterized by assigning the amount of generating signs few rather than the field which does not use the color information to the field using the color information on the color information generating section in the image transmission equipment of above-mentioned claim 4.

[0011] In the image transmission equipment of above-mentioned claim 4 or claim 5, the image transmission equipment of claim 6 concerning this invention adds the speaker distinction section, and is characterized by encoding the color information from the color information generating section except a speaker's field.

[0012] The image transmission approach of claim 7 concerning this invention adds color information only about a speaker in the image transmission approach which notifies a speaker, and it is characterized by the other field encoding as a monochromatic image.

[0013] The image transmission approach of claim 8 concerning this invention adds color information only about a speaker in the image transmission approach which notifies a speaker, the other field is used as a monochromatic image, and it is characterized by performing many allocation-code-izing and transmissions for the amount of generating signs to a speaker field.

[0014]

[Function] In the image transmission equipment of claims 1 and 2, since it is possible to switch the color information encoded according to the need for color information, overall coding effectiveness will increase. When color information is not required, the color information on monochromatic is generated in the color information generating section, and since it becomes possible to encode the color information instead of the color information on an input video signal, it becomes possible to assign many of amounts of generating signs to brightness information. Or since decreasing preferentially from color information is possible when reduction of a sign yield is needed, it becomes possible to make deterioration of the image quality about brightness information into the minimum.

[0015] the noise accompanying [in the image transmission equipment of claim 3, become possible by applying control in the statistical property of the color information on an input video signal to encode a video signal with the color information almost near monochrome as a video signal of perfect monochrome, and] fluctuation and the color information separator of the color information on the space of the input video signal itself, and time amount etc. -- removable -- coming -- high -- efficiency coding is attained.

[0016] In the image transmission equipment of claims 4, 5, and 6, it is preparing the circuit which can control color information to the field of arbitration, and notifying **** of cautions to a specific field to a receiving side and the high promotion of efficiency of coding become possible at coincidence. This is because it is possible to assign the color information which assigns the color information on an input video signal only to an attention field, or the color information generating section outputs. A speaker's notice is attained when especially the speaker distinction section is combined.

[0017] it is possible to assign many generating signs to a speaker's field where a speaker understands at a glance and attracts attention to coincidence in the image transmission approach of claims 7 and 8 -- becoming -- high -- efficiency coding is attained.
[0018]
[Example] Hereafter, the image transmission equipment of the example of this invention is explained, referring to a drawing.
[0019] (The 1st example) Drawing 1 is the block diagram showing the configuration of the image transmission equipment of the 1st example of this invention. The camera equipment with which 1 photos image transmission equipment and 2 photos the speaker of a meeting etc. in drawing 1 , The Y/C separation section from which 3 divides an input video signal into brightness information and color information, the color information generating section in which 4 generates the color information on immobilization (monochrome), The color information switch section to which 5 switches the color information on an input video signal and the color information which the color information generating section 4 outputs, coding and the transmission part to which 6 performs coding of brightness information and color information, multiplex, and transmission, the control section to which 7 performs switch of color information and control of the amount of generating signs, and 8 are transmission lines.
[0020] Next, actuation is explained. The video signal which was photoed with camera equipment 2 and acquired is inputted into the Y/C separation section 3, and is divided into brightness information and color information. These video signals are encoded by coding and the transmission part 6. At this time, it is chosen by the color information switch section 5 among the color information (monochrome) which is chosen, and is fixed and outputted about color information among the video signals encoded in the color information on an input video signal and the color information generating section 4 which are outputted from the Y/C separation section 3 any they are. When the color information from the Y/C separation section 3 is chosen, the color information of an input video signal itself is inputted into coding and a transmission part 6, and when the color information from the color information generating section 4 is chosen, the color information (monochrome) is inputted into coding and a transmission part 6. The color information generating section 4 has generated the color information on monochromatic (one color not only in black and white but various kinds of colors), therefore, in the former selection, in the latter selection, is encoded as a monochromatic image as an image of coloring. In coding and a transmission part 6, brightness information and color information are carried out coding and multiplex, and are decoded by the receiving side through a transmission line 8.
[0021] Usually, although the image transmission equipment 1 is transmitting the video signal of coloring, when there was a demand from the user of a local station or a game, or when there is communication that the terminal of a game can display only in monochrome, a control section 7 directs to choose the color information from the color information generating section 4 to the color information switch section 5.
[0022] Moreover, when for example, a limit of the amount of generating signs by the video signal is needed by a certain reason to use reduction in a number of circuit, and a part of transmission-line capacity for other purposes, a control section 7 emits the directions which switch color information to the information on monochromatic, controls the amount of generating signs of coding and a transmission part 6, and assigns more generating signs to brightness information.
[0023] since more generating signs can be assigned to brightness information according to this example as mentioned above when color information is not required -- high -- efficiency coding is attained. Moreover, since it becomes possible to make it decrease from color information preferentially when the need for reduction of the amount of generating signs arises, about brightness information, degradation of image quality can be suppressed to the minimum.
[0024] (The 2nd example) Drawing 2 is the block diagram showing the configuration of the image transmission equipment of the 2nd example of this invention. The camera equipment with which 1 photos image transmission equipment and 2 photos the speaker of a meeting etc. like the 1st example in drawing 2 , The Y/C separation section from which 3 divides an input video signal into brightness information and color information, the color information generating section in which 4

generates the color information on immobilization (monochrome), The color information switch section to which 5 switches the color information on an input video signal, and the color information which the color information generating section 4 outputs, It is the monochrome judging section which coding and the transmission part to which 6 performs coding of brightness information and color information, multiplex, and transmission, and 8 are based on a transmission line, and 9 is based on the statistical property (how much is the variation in the color in the inside of a certain area?) of an input video signal, and controls the color information switch section 5 and the color information generating section 4.

[0025] Next, actuation is explained. The video signal which was photoed with camera equipment 2 and acquired is inputted into the Y/C separation section 3, and is divided into brightness information and color information. It encodes by coding and the transmission part 6, and these video signals are transmitted to a receiving side through a transmission line 8. Moreover, these video signals are inputted also into the monochrome judging section 9, and it judges whether selection and the representation color of a representation color are used from the statistical property. When it is judged that it encodes and transmits in a representation color, it directs to choose the color information on the color information generating section 4 to the color information switch section 5, and the color information which should be generated to the color information generating section 4 is directed. When it is judged that it does not transmit in a representation color, it directs to choose the color information on an input video signal to the color information switch section 5.

[0026] thus, the image quality of the video signal which will suppress fluctuation of color information and is transmitted since monochrome is chosen and it fixes when encoding and transmitting the video signal of the photographic subject near monochrome according to this example (representation color) -- more -- high definition -- carrying out -- high -- efficiency transmission is attained.

[0027] In addition, in the above, if a representation color is monochrome, the color of immobilization is sufficient [it does not need to be a color called for from a property (statistical property) peculiar to an input video signal, and] as it regardless of an input video signal. Moreover, although actuation in a frame unit is assumed in this example, selection of the color information on the color information generating section 4 and generating color information may change per specific field (for example, one fourth of fields of a frame).

[0028] (The 3rd example) Drawing 3 is the block diagram showing the configuration of the image transmission equipment of the 3rd example of this invention. The camera equipment with which, as for 1, image transmission equipment, and 2A - 2D photo the speaker of a meeting etc. like the 1st example in drawing 3 , The color information generating section in which 4 generates the color information on immobilization (monochrome), the color information switch section to which 5 switches the color information on an input video signal, and the color information which the color information generating section 4 outputs, Coding and the transmission part to which 6 performs coding of brightness information and color information, multiplex, and transmission, The image composition section which compounds the video signal into which it is inputted from camera equipment 2A of plurality [8 / 10 / a transmission line and] - 2D, divides into brightness information and color information and is outputted, The speaker distinction section from which 11 distinguishes the speaker in a speaker, and 12 are field control sections which control the color information generating section 4, the color information switch section 5, and coding and a transmission part 6.

[0029] Next, actuation is explained. The video signal which was photoed by camera equipment 2A - 2D, and was acquired is inputted into the image composition section 10, and composition of an image and separation of brightness information / color information are performed. It encodes by coding and the transmission part 6, and these video signals are transmitted to a receiving side through a transmission line 8. Moreover, monochrome-ization of a non-speaker's field is performed so that the field control section 12 may show who a speaker is according to the output of the speaker distinction section 11.

[0030] Drawing 4 expresses the image in each part at the time of assuming that Speaker A has spoken, and the field where the slash section has change of color information, and the part

without a slash show the field where only brightness information changes with a value (monochrome) with single color information. Here, drawing 4 (a) shows the example of the video signal outputted from the image composition section 10, and drawing 4 (b) expresses the input image to coding and a transmission part 6.

[0031] The field control section 12 chooses the color information on an output from the image composition section 10 in a speaker's field according to control of the speaker distinction section 11, and it controls the color information switch section 5 by the other field to choose the color information from the color information generating section 4 while controlling the color information generating section 4 and making suitable monochrome choose. Moreover, control which assigns more amounts of signs about a speaker field to coding and a transmission part 6 is performed.

[0032] thus -- it is possible to assign many generating signs to a speaker's field where a speaker understands at a glance and attracts attention to coincidence according to this example -- becoming -- high -- efficiency coding is attained.

[0033] In addition, although the synthetic image of one sheet is generated from four camera equipments corresponding to a speaker and only the speaker's field is staining in this example, it is also possible to extract a speaker field to the video signal which photoed two or more speakers with one camera equipment, to stain and to transmit only to a speaker's field among those fields. Moreover, although an input video signal is a thing from camera equipment and it is the video signal of a local station in this example, it is also possible to take the gestalt of decoding and compounding the video signal instead transmitted from two or more other stations, switching color information, and performing coding and transmission. Although this example is assigning the color information on an input signal to the observing point, it is also possible to assign the color information on the color information generating section 4 conversely.

[0034]

[Effect of the Invention] since many generating signs can be assigned by brightness information according to this invention as mentioned above when color information is not required -- quantity -- efficiency coding is attained. Moreover, since it becomes possible to make it decrease from color information preferentially when the need for reduction of the amount of generating signs arises, about brightness information, degradation of image quality can be suppressed to the minimum.

[0035] moreover, the image quality of the video signal transmitted since fluctuation of color information will be suppressed when encoding and transmitting the video signal of the photographic subject near monochrome -- more -- high definition -- it can do -- or -- high -- efficiency transmission is attained.

[0036] moreover -- it is possible to assign many generating signs to a speaker's field where a speaker understands at a glance and attracts attention to coincidence -- becoming -- high -- efficiency coding is attained.

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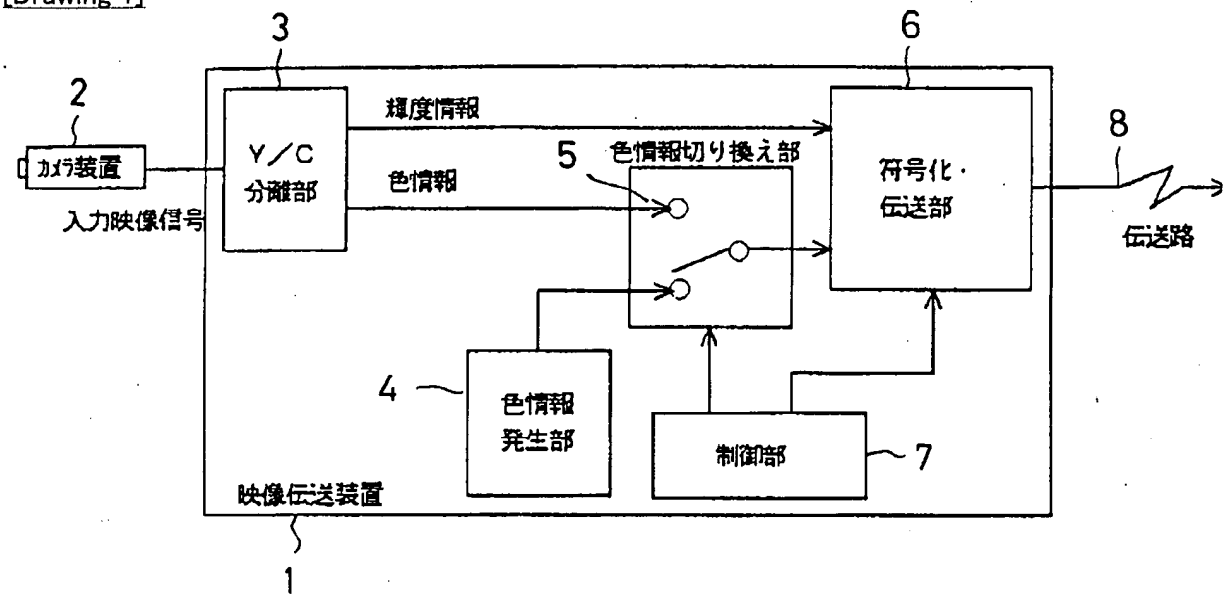
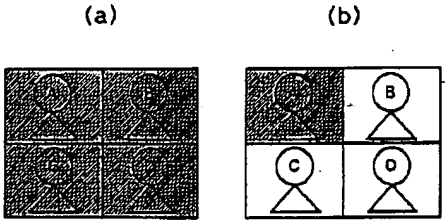
DRAWINGS

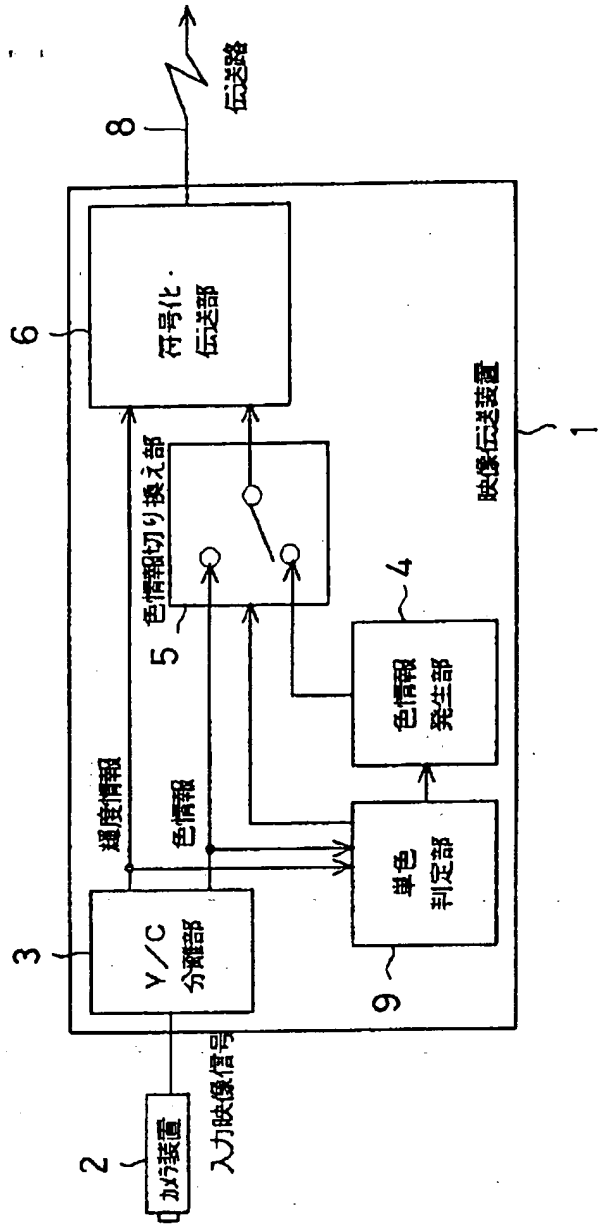
[Drawing 1]



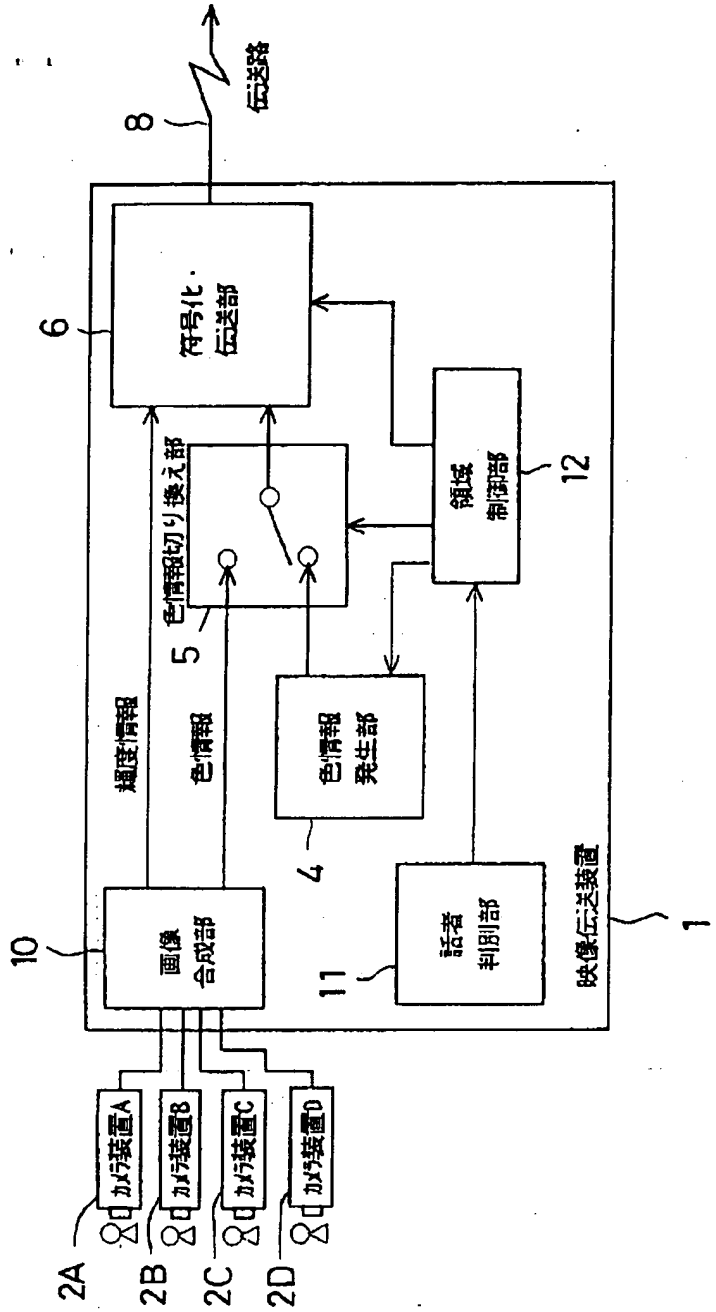
[Drawing 4]



[Drawing 2]


伝送路
8
符号化・伝送部
6
映像伝送装置
1
色情報切り換え部
5
4
色情報発生部
輝度情報
色情報
単色判定部
9
Y／C分離部
3
入力映像信号
カメラ装置
2

[Drawing 3]



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